Hsing-Chen Tsai, M.D., Ph.D.
Graduate Institute of Toxicology
College of Medicine
National Taiwan University
No.1 Jen Ai road, Section 1, Taipei 100, Taiwan
Phone No.: 02-2312-3456 ext. 288797
Fax No.: 02-23410217
E-mail: htsai@ntu.edu.tw
Web: http://tsailab.cm.ntu.edu.tw

Education

1992-1999	M.D., National Taiwan University, Taiwan
2002-2004	M.S., Graduate Institute of Clinical Medicine, National Taiwan Univ., Taiwan
2005-2011	Ph.D., Johns Hopkins University School of Medicine, USA

Research and Professional Positions Held in Chronological Sequence

1999-2002	Resident, Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan
2002-2004	Clinical Fellow, Division of Chest Medicine, Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan
2003-2004	Chief Resident, Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan
2011-2014	Research Fellow, Department of Oncology, Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins, Baltimore, USA
2014-2022	Assistant Professor Graduate Institute of Toxicology, College of Medicine, National Taiwan University, Taipei, Taiwan
2014-present	Attending physician, Division of Chest Medicine, Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan
2021-present	Deputy Director, NTUH Center for Frontier Medicine, National Taiwan University Hospital, Taipei, Taiwan
2022-present	Associate Professor Graduate Institute of Toxicology, College of Medicine, National Taiwan University, Taipei, Taiwan
2025-present	Joint Appointment Associate Research Fellow, Institute of Biomedical Sciences, Academia Sinica

Research Interests

Our research focuses on unraveling the intricate interplay between cancer cells and the tumor immune microenvironment from an epigenetics perspective. By bridging basic

research, translational medicine, and clinical applications, our goal is to develop innovative cancer immunotherapies and diagnostic strategies, ultimately leading to improved patient outcomes.

Our key research directions include:

- Epigenetic Regulation of the Tumor Immune Microenvironment — We investigate how epigenetic mechanisms shape the tumor immune microenvironment by regulating immune cell differentiation, activation, and dysfunction. Using a targeted drug screening platform, we have identified epigenetic compounds that restore polyfunctionality and plasticity in exhausted T cells. Our research explores the metabolic pathways underlying these effects and their broader impact on anti-tumor immunity. We also apply multi-omics approaches to characterize peripheral immune alterations in early-stage lung cancer, aiming to identify blood-based epigenetic biomarkers and develop strategies to restore systemic immune competence.
- γδ T Cell-Based Cancer Immunotherapy — Our lab develops γδ T cells for adoptive cellular immunotherapy, leveraging their HLA-independent tumor recognition and rapid cytotoxic activity. We have established a clinical-grade γδ T cell expansion protocol and are optimizing it for regulatory compliance. Concurrently, we study the molecular and synaptic mechanisms of γδ T cell-mediated tumor killing and are identifying predictive biomarkers of expansion efficiency and therapeutic potency. Our goal is to enable γδ T cell-based precision immunotherapies for clinical application.

Major Honors and Awards

2005	Taiwan Merit Scholarship, by Taiwan's Ministry of Education, Council for Economic Planning and Development, and National Science Council
2012	Honorable Mention for Basic Research, The Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins
2016	Best oral presentation award, Annual Meeting of Pulmonary Critical Care Medicine, Taiwan Society of Pulmonary and Critical Care Medicine
2017	Young Investigator Outstanding Research Award, National Taiwan University Hospital (臺大醫院傑出研究獎)
2020	The ITRI 2020 Janssen-Taiwan Research Grant Awardee
2021	The 18th National Innovation Award (國家新創獎)
2022	The Ming Chai Medical and Education Foundation Interdisciplinary Research Award
2024	Fellow of the Asian Pacific Society of Respirology (亞太呼吸學會會士)